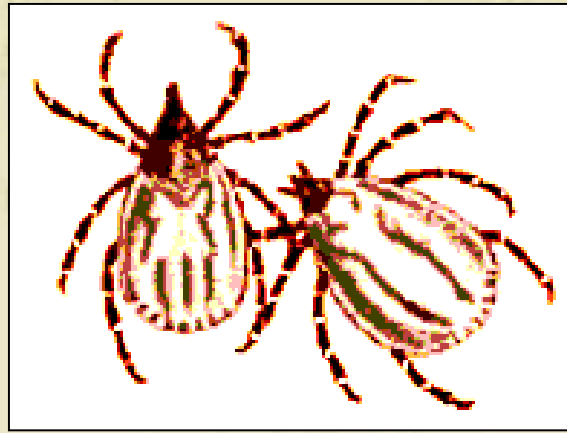
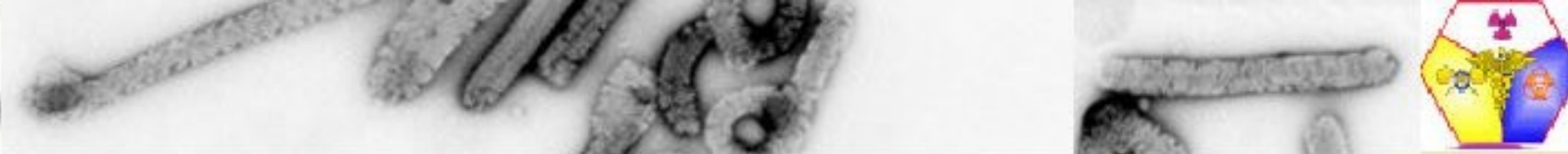




Medical NBC Briefing Series ***Medical NBC Aspects of*** **Crimean-Congo Hemorrhagic** **Fever**





Purpose

- ***This presentation is part of a series developed by the Medical NBC Staff at The U.S. Army Office of The Surgeon General.***
- ***The information presented addresses medical issues, both operational and clinical, of various NBC agents.***
- ***These presentations were developed for the medical NBC officer to use in briefing either medical or maneuver commanders.***
- ***Information in the presentations includes physical data of the agent, signs and symptoms, means of dispersion, treatment for the agent, medical resources required, issues about investigational new drugs or vaccines, and epidemiology.***
- ***Notes page.***



Office of the Surgeon General
for the Army



Outline

- **Background**
- **Battlefield Response**
- **Medical Response**
- **Command and Control**
- **Summary**
- **References**





Background

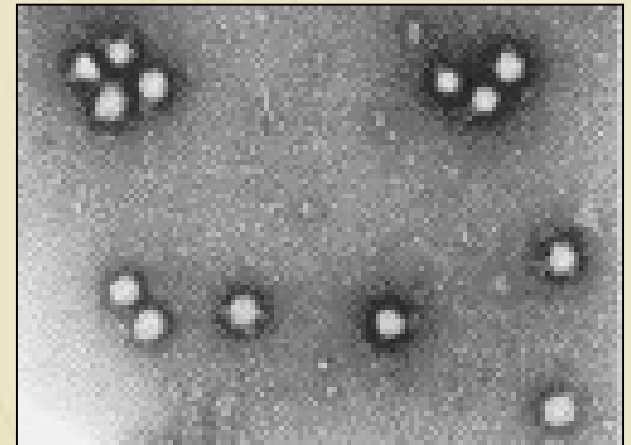
- **Disease Background**
- **Disease Course Summary**
- **Signs and Symptoms**
- **Diagnosis**
- **Treatment**
- **Current Situation**
- **Weaponization**

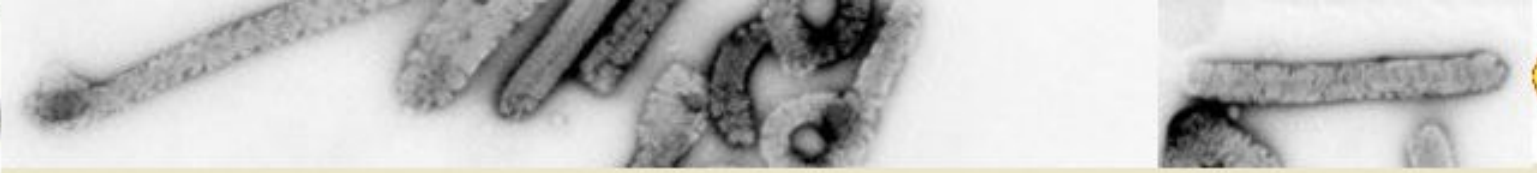




Disease Background

- **RNA viruses - Nairovirus**
- **Crimean-Congo Hemorrhagic Fever isolated in 1956**
- **15-50 case mortality rate**
Epidemic noted in 1996 in Africa
- **Spread to humans by contact with infected animals or arthropod vectors (ticks)**
- **Incapacitating disease with a fatality rate of 15-70%**





Crimean-Congo Fever Disease Course Summary In Untreated Individuals

Individuals						
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
EXPOSUR E	Fever, malaise, weakness, irritability, headache, pain in limbs, anorexia					
	Incubation 1-14					
		Days				
Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Rash, bleeding from mouth, nose, and intestines, hemorrhage, shock → Death						
Incubation 1-14						
		Days				
Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28



Signs and Symptoms Crimean-Congo Fever



- 1-14 day incubation period - often transmitted by tick bite
- Sudden onset of Fever, Chills, Hypotension, Headache and back
- Acute and severe hemorrhage
- Prolonged recovery
- Loss of strength, dizziness, hair loss after recovery



Diagnosis Clinical

- Large numbers of individuals in the same geographic area presenting over a short time span
- Acute onset of





Diagnosis Laboratory

- **Blood testing**
- **Requires maximum biosafety laboratory**
- **Handling specimens should be with extreme caution and special collection and handling methods must be used**





Treatment

- Isolation of known cases
- Ribavirin
- Supportive care - substantial advanced medical supportive may be necessary
 - Intensive care unit facilities
 - Oxygen
 - Hydration (IV therapy)
 - Ventilation support for severe cases
 - Pain management
 - Clotting factors
- A vaccine has been developed but is not available





Current Situation

- **Currently endemic in parts of Asia and Africs**
- **As a biological warfare agent, Crimean-Congo Fever poses a significant threat to ground troops**
 - Highly transmissible
 - Infectious
 - Lethal
 - Easily dispersible to ground troops as an aerosol
 - Stable in the environment
- **International deployments**
- **Risk of importation/exportation of disease**



Weaponization

- **Aerosolization**
 - Inhalation threat
 - Delivery systems can be simulated
 - Spray systems
 - Submunitions
 - Detonation containers
 - Crop duster or boat
 - Bomblets
 - Aircraft



M143 Biological bomb - used for anti-crop, anti-animal, or anti-personnel purposes.





Battlefield Response to Crimean-Congo Fever

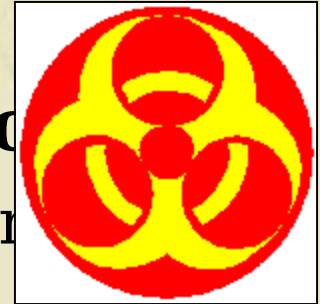
- **Detect**
- **Protect**
 - Individual protection
 - Collective protection

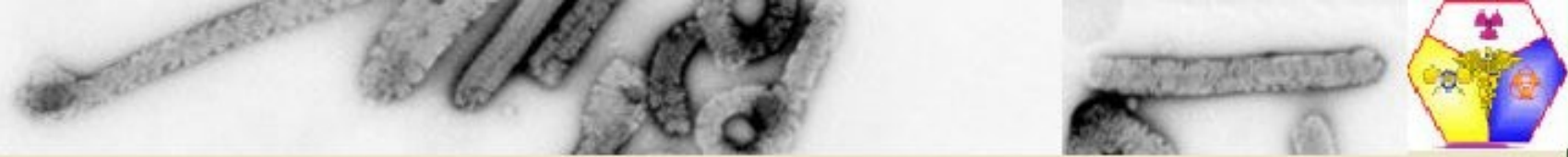




Detection

- **Possible methods of detection**
 - Detection of agent in the environment
 - Clinical (differential diagnosis)
 - Medical surveillance (coordination enhances detection capability)
- **Diagnosis of Crimean-Congo Fever is not presumptive of a BW attack**
 - the disease may be endemic to the area





Detection of Agent in the Environment

- Biological Smart Tickets
- Enzyme Linked Immunosorbant Assay (ELISA) (Fielded with the 520th TAML)
- Polymerase Chain Reaction (PCR) (Fielded with the 520th TAML)





Detection of Agent in the Environment (cont.)

- M31E1 Biological Integrated Detection System (BIDS)
- Interim Biological Agent Detector (IBAD)



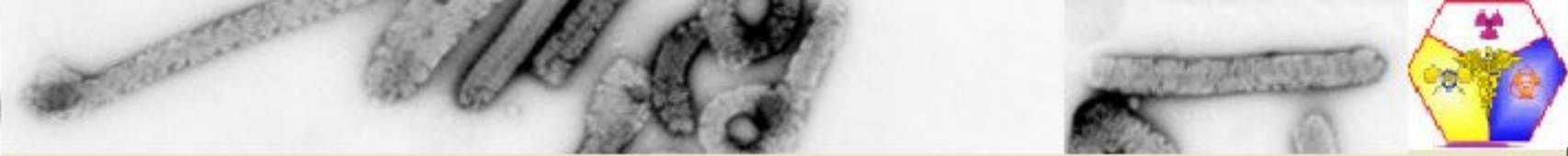


Clinical Detection

Sudden presentation of

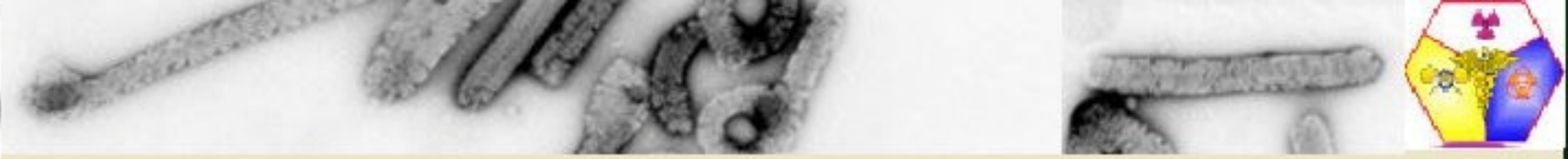
- Fevers, chills, eye infections, and mild hypotension presenting in groups
- Rapid progression of symptoms





Laboratory Confirmation

- **Division medical assets lack lab equipment to conduct test to determine hemorrhagic fevers**
- **Specimen must be sent to theater level or CONUS lab**
 - Unit SOP's for collection
 - Safety precautions
- **Lab specimens should be submitted to the correct diagnostic laboratory**
- **Contact lab prior to collection or preparation in order to assure proper methods are utilized**



Laboratory Confirmation (cont.)

Points of contact for biological sampling and shipping

- Corps Chemical Officer
- Technical Escort Unit
- AFMIC
- 520th TAML
- USAMRIID
- WRAIR
- CDC







Medical Surveillance

Clues in the daily medical disposition reports of a BW Attack

- Simultaneous presentations of large numbers of infected
- Natural outbreaks would have an index case and the numbers would build
- Numerous reports of fevers, chills, eye

 **MARYLAND ARMY NATIONAL GUARD**
DISCOM 29th Infantry Division (Light)
DIVISION MEDICAL OPERATION CENTER (DMOC) 

Patient Summary Report
29th INF (L) DIV

From: Division Medical Operations Center (DMOC)
To: Division Surgeon

Date Time Group: From: 121200RJUN99
To: 202400RJUN99

PATIENTS

Nation	WIA	NBI	Disease	Neuropsychiatric Stress-Related	Total
US	0	97	55	0	152
Allied	0	0	0	0	0
EPW	0	0	0	0	0

DISPOSITION

Return to duty	148
Holding in Division's MTFs	0
Evacuated and returned	3
Evacuated by air	0
Evacuated by ground	1
Expired en route	0
Expired in MTF	0



Protect Individual Protection

- Mask and BDO with gloves and boots.
- Standard uniform clothing affords a reasonable protection against dermal exposure to biological agents
- Casualties unable to wear MOPP should be handled in casualty wraps





Protect Collective Protection

- Hardened or unhardened shelter equipped with an air filtration unit providing overpressure
- Standard universal precautions should be employed as individuals are brought inside the collective protection units
- RVF is communicable from person to person
- Contaminated articles can be decontaminated using 0.05% hypochlorite solution

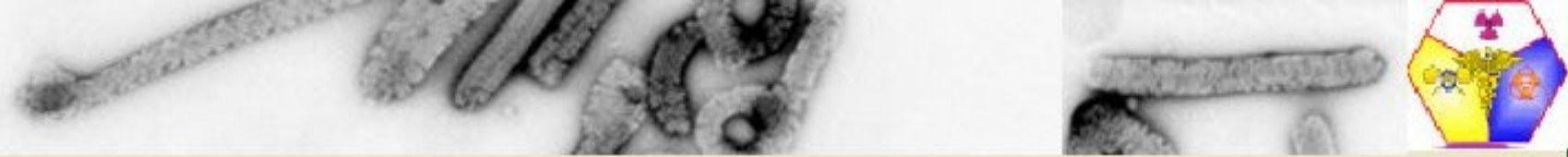




Medical Response to Crimean-Congo Hemorrhagic Fever

- Triage and Evacuation
- Evacuation or Quarantine
- Infection Control
- Resource Requirements





Triage and Evacuation

- **Triage**

- Priorities based on severity of symptoms
- Respiratory support, ICU needs, and quarantine facilities will increase priorities

- **Evacuation -Immediate**

- Considerable infection control precautions during transport
- Must consider quarantine in place in a mass casualty situation
- Evacuation of patients will be METT-T dependent



Evacuation or Quarantine



Figure 8-6. Arms carry.

- CCHF patients not likely to RTD in the normal theater evacuation policy of 15 days
- Strict interpretation of the doctrine calls for evacuation

- **Quarantine**

- Contagious
- Limit spread of the virus
- Unlike smallpox, CCHF is already endemic to various parts of the world

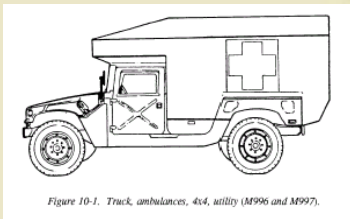
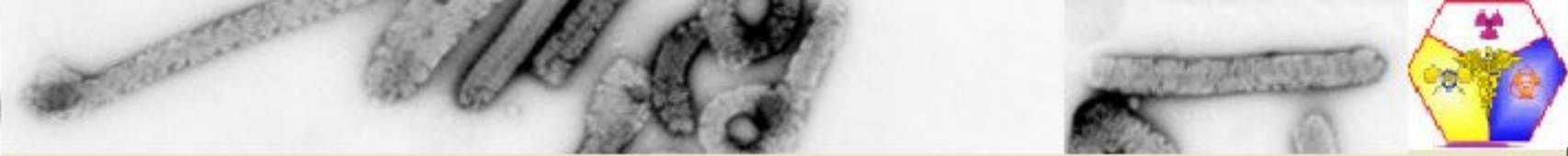


Figure 10-1. Truck, ambulances, div4, utility (M996 and M997).

- **Guidance**

- Before evacuating patients suspected of CCHF, seek guidance from the



Infection Control

- **Communicable from person to person**
- **Single room with adjoining anteroom as only entrance**
 - Hand washing facility with decontamination solution
- **Negative air pressure if possible**
- **Strict barrier precautions**
 - gloves, gown, mask, shoe covers, protective eyewear/face shield
 - consider HEPA respirator for prominent hemorrhage, vomiting, diarrhea, cough
- **Patient remains - Quartermaster section**
 - Decontamination, embalming, transportation in hermetically sealed containers

DOXYCYCLINE



Infection Control (cont)

- Chemical toilet
- All body fluids disinfected
- Disposable equipment / sharps in rigid containers and autoclaved /incinerated
- Double-bag refuse-outside bag disinfectant
- Electronic/mechanical equipment covered with paraformaldehyde disinfected

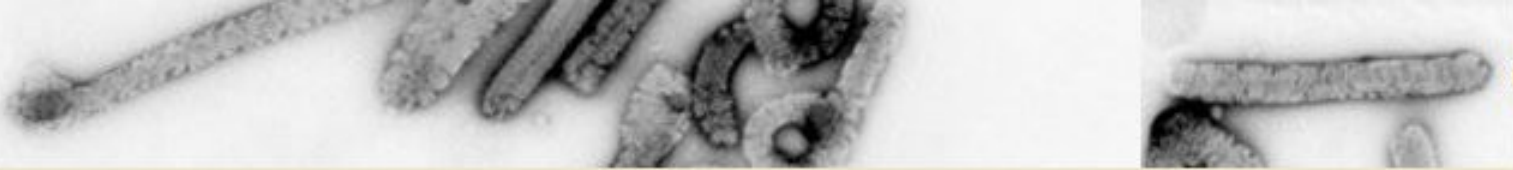




Resource Requirements

- **Specialized evacuation assets**
- **Isolation facilities**
- **Ribavirin**
- **Supportive therapies**
 - Vigorous IV therapy
- **Intensive care facilities for severely compromised patients**
- **Possibility for quarantine of mass amounts of patients**
- **Specialized infection control equipment for care providers**





Command and Control

- **Intelligence**

- Medical surveillance and intelligence reports are key to keep the Command alert to the situation

- **Maneuver**

- Quarantine or isolation is required of symptomatic patients

- **Logistics**

- Additional Class VIII materials will be required and evacuation routes to Echelon III will be heavily utilized
- Specialized evacuation assets may be required

- **Manpower**

- Many soldiers may be affected by aerosol dissemination in a short period of time



Command and Control Response to Psychological Impact

- **May vary from person to person**
- **Psychological Operations**
 - Rumors, panic, misinformation
 - Soldiers may isolate themselves in fear of disease spread
- **Countermeasures**
 - LEADERSHIP is responsible for countering psychological impacts through education and training of the soldiers
 - Implementation of defensive measures such as crisis stress management teams



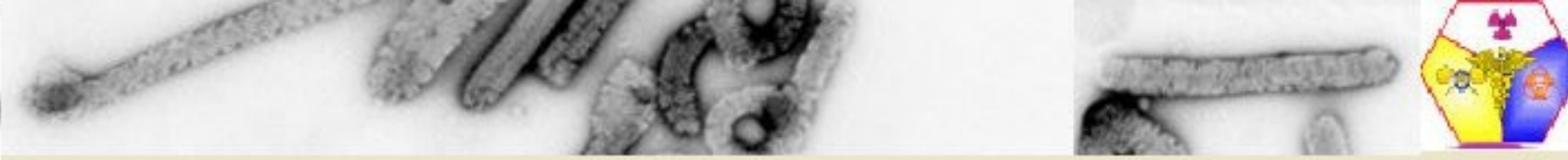
Summary

- **Crimean-Congo Fever virus is highly infectious when aerosolized**
- **The possibility for weaponization is highly probable**
- **Detection may not occur until after exposure when patients are reported**
- **Command decisions that will be required upon detection of Crimean-Congo Fever:**
 - Evacuation: Many patients will be presenting at one time. Methods of evacuation?
 - Treatment: Procurement of additional antiviral, supplies, and equipment? Isolation of affected troops? Intensive care facilities?



References

- **Biological and Chemical Warfare Online Repository and Technical Holding System (BACWORTH), Version 3.0.** Battelle Memorial Institute, 1997.
- **Chin, James, *Control of Communicable Diseases Manual 17th Edition*, American Public Health Association, 2000.**
- **Department of the Army. FM 8-10-6: *Medical Evacuation in a Theater of Operations*. April 2000.**
- **Department of the Army. FM 8-10: *Health Service Support In A Theater of Operations*. March 1991.**
- **Department of the Army. FM 8-284: *Treatment of Biological Warfare Agent Casualties*. July 2000.**
- **Department of the Army, U.S. Army Medical Research Institute of Infectious Diseases. *Medical Management of Biological Casualties*. July 1998.**
- **Department of the Army, U.S. Army Medical Research Institute of Chemical Defense. *Medical Management of Chemical and Biological Casualties*. May 2000.**
- **Henderson, D.A., Bioterrorism as a Public Health Threat. *Emerging Infectious Diseases* Vol 4 No 3, July 1998.**
- **Chin, James., *Control of Communicable Diseases Manual*, 17th Edition. American Public Health Association., Washington D.C., 2000.**
- ***Medical Aspects of Chemical and Biological Warfare (in Textbook of Military Medicine Series Part I: Warfare, Weaponry, and the Casualty)*, edited by F. R. Sidell, E. T. Takafuji, and D. R. Franz. Washington, DC: TMM Publications, 1997.**
- **National Research Council and Institute of Medicine., *Chemical and Biological Terrorism, Research and Development to Improve Civilian Medical Response*, Washington DC: National Academy Press, 1999.**
- **USACHPPM, Technical Guide 244: *The Medical NBC Battlebook*, July 1999.**



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